REMARKS

Claims 1-4, 6, 7, 11-16 and 49-53 are pending. With the previous cancellation of claim 2, 5, 8-10 and 17-48, the previous addition of claims 49-53 and 64, and the renumbering of claim 64 as the new claim 54, claims 1, 3, 4, 6, 7, 11-16 and 49-54 are pending.

Claims 1 and 49 are amended in this Supplemental Response to correct a typographical error in claims 1 and 49 as suggested by the Examiner in the Advisory Action. Descriptive support for the amendments to claims 1 and 49 can be found in the specification at least in column 6, lines 48-49.

STATUS OF CLAIMS AND SUPPORT FOR CLAIM CHANGES

1. (Pending) The amendment to claim 1 is supported, for example, by column 6, lines 47-63, Examples 4 and 5 and Figure 3 of the specification. Five embodiments of the current invention are disclosed as recombinant gene constructs in Example 4 and demonstrated to synthesize farnesyl diphosphate having a shorter chain length than the native gene in Example 5 and Figure 3 of the specification. Col. 12, line 1 through Col. 14, line 16. Descriptive support can be also be found in column 6, lines 47-63. Claim 1 presented in the Response to Office Action filed July 13, 2010 is amended by replacing "threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine replacing histidine at position 81 of SEQ ID NO:1 is replaced with alanine" with "threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine and histidine at position 81 of SEQ ID NO:1 is replaced with alanine". Support may be found, for example, in column 6, lines 48-49.

2. (Canceled)

3. (Pending) The amendment to claim 3 is editorial and supported by the patent claim 3.

4. (Pending) The amendment to claim 4 is editorial and supported by the patent claim 4. An editorial amendment has been made in this Response, per the suggestion of Examiner Steadman, by replacing "is a homodimer" with "forms a homodimer".

5. (Canceled)

6. (Pending) The amendment to claim 6 is editorial, supported by the specification at column 6, lines 22-34 and performed as suggested by the Examiner.

7. (Pending) The current amendment is supported by Example 5 and Figure 2. The amendment has been made as suggested by the Examiner to delete the process conditions used to determine the thermostability. With the deletion of the process conditions, the amended claim would not narrow in scope. In addition, the temperature, i.e., 70° C or 80° C, at which the mutant prenyl diphosphate synthase is more stable than the wild type enzyme has been inserted in this Response as supported by the data of Figure 2.

8-10. (Canceled)

11. (Pending) The amendment to claim 11 is editorial by replacing "an enzyme" with "the mutant prenyl diphosphate synthase".

12. (Pending) The current amendment to claim 12 is made as suggested by the Examiner. The amended claim 12 more directly recites the claimed RNA by replacing "transcribed from the DNA according to claim 11" with "encoding the mutant prenyl diphosphate synthase according to clam 1". The current amendment would not narrow the scope of the claim because the RNA transcribed from the DNA encoding the mutant prenyl diphosphate synthase is also he RNA encoding the mutant prenyl diphosphate synthase.

13. (Pending) The amendment to claim 13 is editorial by replacing "a" with "the".

14. (Pending) The current amendment to claim 14 is made as suggested by the Examiner. Claim 14 is amended to more directly recite the claimed subject matter by replacing "organism" with "cell". The current amendment would not narrow the scope of the claim because an isolated host organism transformed the mutant vector naturally involves transformation of the isolated host cell.

15. (Pending) The current amendment is editorial by replacing "host" with "isolated host cell". The amendment is made as requested by the Examiner. In order to culture a host, it naturally involves culturing the isolated host cell. Thus, the current amendment would not narrow the scope of the claim

16. (Pending) The amendment to claim 16 is editorial by replacing "an enzyme" with "the mutant prenyl diphosphate synthase" previously and by deleting the dependency on claim 2 in this Response because claim 2 has been cancelled.

17-48. (Canceled)

49. (Pending) Claim 49, a claim not found in the patent, is amended from claim 49 presented in the Response to Office Action filed July 13, 2010 by replacing "threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine replacing histidine at position 81 of SEQ ID NO:1 is replaced with alanine" with "threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine and histidine at position 81 of SEQ ID NO:1 is replaced with alanine". Support may be found, for example, in column 6, lines 48-49.

50. (Pending) Claim 50, a claim not found in the patent, is amended from claim 50 presented in the Response to Office Action filed February 16, 2010 by replacing the active voice with the passive voice to be consistent with the current amendments to claim 1 without chancing the claim scope. The recitation "wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing threonine with phenylalanine at position 78 and replacing histidine with leucine at position 81" is replaced with "having the amino acid sequence of SEQ ID NO:1 except that threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine and histidine at position 81 of SEQ ID NO:1 is replaced with leucine". Support may be found, for example, in column 6, lines 50-51 and in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:10 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

51. (Pending) Claim 51, a claim not found in the patent, is amended from claim 51 presented in the Response to Office Action filed February 16, 2010 by replacing the active voice with the passive voice to be consistent with the current amendments to claim 1 without chancing the claim scope.. The recitation "wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing phenylalanine with tyrosine at position 77, replacing threonine with phenylalanine at position 78 and replacing histidine with leucine at position 81" is replaced with "having the amino acid sequence of SEQ ID NO:1 except that phenylalanine at position 77 of SEQ ID NO:1 is replaced with tyrosine, threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine, and histidine at position 81 of SEQ ID NO:1 is replaced with leucine". Support may be found, for example, in column 6, lines 52-54 and in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:11 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

52. (Pending) Claim 52, a claim not found in the patent, is amended from claim 52 presented in the Response to Office Action filed February 19, 2010 by replacing by replacing the active voice "replacing" with the passive voice "is replaced" to be consistent with the current amendments to claim 1 without chancing the claim scope. The recitation "wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing phenylalanine with tyrosine at position 77, replacing threonine with phenylalanine at position 78 and replacing histidine with alanine at position 81" is replaced with "having the amino acid sequence of SEQ ID NO:1 except that phenylalanine at position 77 of SEQ ID NO:1 is replaced with tyrosine, threonine at position 78 of SEQ ID NO:1 is replaced with phenylalanine, and histidine at position 81 of SEQ ID NO:1 is replaced with alanine". Support may be found for claim 52, for example, in column 6, lines 56-58 and in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:12 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

53. (Pending) Claim 53, a claim not found in the patent, is amended from claim 53 presented in the Response to Office Action filed February 19, 2010 by replacing by replacing the active voice "replacing" with the passive voice "is replaced" to be consistent with the current amendments to claim 1 without chancing the claim scope. The recitation "wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing phenylalanine with tyrosine at position 77, replacing threonine with serine at position 78, replacing valine with isoleucine at position 80, replacing isoleucine with leucine at position 84 and inserting proline and serine sequentially between position 84 and position 85" is replaced with "having the amino acid sequence of SEQ ID NO:1 except that phenylalanine at position 77 of SEQ ID NO:1 is replaced with tyrosine, threonine at position 78 of SEQ ID NO:1 is replaced with serine, valine at position 80 of SEQ ID NO:1 is replaced with isoleucine, isoleucine at position 84 of SEQ ID NO:1 is replaced with leucine, and proline and serine are inserted sequentially between position 84 and position 85 of SEQ ID NO:1" . Support may be found for claim 53, for example, in column 6, lines 59-63 and in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:13 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

Claim 54. (New) The claim 64 added in the preceding Response to Office Action is renumbered as Claim 54 as suggested by an earlier final Office Action. Descriptive support for claim 54 can be found in Example 5. The wording of the former claim 64 in the new claim 54 per the suggestion of the Examiner to delete the process conditions used to measure the synthesis of farnesyl diphosphate. With the deletion of the process conditions, the amended claim would not narrow in scope.

Claim Objection

Claim 1 was objected to for editing purposes to improve claim form without changing the scope of the claim. Claim 1 has been amended according to the suggestions of the final Office Action and the Advisory Action of July 23, 2010 in order to improve the form per the suggestion of the final Office Action. Withdrawal of the objection to claim 1 is requested.

With the objection to claim 1 dealt with by adopting the amendments suggested by the Examiner, applicants believe that the objections to claims 3, 4, 6, 7, 11-16 and 49-54 are rendered moot.

Objection of the Reissue Declaration

Applicants respectfully request that the Examiner hold the objection to the Reissue Declaration in abeyance until the claims are otherwise found allowable. The abeyance request is made because, to present an error under 35 U.S.C. 251 to support the reissue application in the Reissue Declaration, applicants would present claim 1 with the amendments allowed by the Examiner in a Substitute Reissue Declaration. As a result, once the claims are held by the Examiner to be otherwise allowable, applicants would prepare a Substitute Reissue Declaration containing the otherwise allowed claim 1 for the inventors to sign, which applicants believe would take care of the concerns of the Examiner as related to the Reissue Declaration.

CONCLUSION

At least in view of the above reasoning, the claims are believed to be in condition for allowance. The Examiner is invited to contact the undersigned to discuss any issues related to this application.

In the event that the filing of this paper is deemed not timely, applicants petition for an appropriate extension of time. The Office is authorized to charge any fees, including the extension fee, or credit any overpayment regarding this application to Kenyon & Kenyon LLP **Deposit Account No. 11-0600**.

Respectfully submitted,

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